

UNIVERSITY OF SASKATCHEWAN  
Department of Computer Science

CMPT 215.3 IN-LAB EXAMINATION

(Group D)

November 2, 2000

Total Marks: 10

OPEN BOOK and OPEN NOTES

Time: 90 minutes (5:00pm-6:30pm)

Instructions

Both questions are programming questions. You'll need to design algorithms, write, debug, and test MIPS assembly programs. The marks for each question are as indicated. Allocate your time accordingly.

1. (5 marks) Read in from the keyboard a sequence of **non-zero** integers finished by a 0, and print the maximum and the second maximum of them. Note that the last 0 does not belong to this sequence of integers. For example, if the user inputs the following four numbers: 10, 3, 7, 0, the output should be:

*The maximum is 10*

*The second maximum is 7*

2. (5 marks) Implement function `int delete(int index, int array_addr, int array_len)` that deletes the data from an integer array at the location specified by the *index* and returns the deleted item. Assume that the *index* starts at 0 and always exists, i.e.  $0 \leq \text{index} < \text{array\_len}$ . In the function, the *array\_addr* is the starting address of the integer array, and the *array\_len* is the total number of integers in the array. After the data at the location *index* is deleted from the array, all elements from *index+1* until the end of the array are shifted one location to the left. For example, assume the original array is 7, 24, 15, 3, 9 (whose length is 5), after you delete the second integer 24 (i.e. the *index* is 1) from the array, it is changed to 7, 15, 3, 9, and the new length of which becomes 4.

In your *main*, you should test the function *delete* by first creating an array with five integers 7, 24, 15, 3, 9, and then calling the function as follows:

*Item1 = delete(2, array\_addr, array\_len\_1)*

*Item2 = delete(0, array\_addr, array\_len\_2)*

*Item3 = delete(array\_len\_3 - 1, array\_addr, array\_len\_3)*

The correct value for the array length should be used. After each deleting, print the integer deleted from the array and the resulted new array. Note that " " (space) should be used to separate array elements from each other when printing the array.